Prize (2500 fr.), for improvements in steam engines or any other invention which contributes to the progress of steam navigation; and the Fourneyron Prize (500 fr.), for a theoretical or experimental study of steam turbines.

In Astronomy, the Lalande Prize (540 fr.), for the best work tending to the advancement of astronomy; the Valz Prize (460 fr.), for the most interesting observation during the current year. In Physics, a La Caze Prize (10,000 fr.); the Gaston Planté Prize (3000 fr.), for a discovery, invention or important work in the field of electricity; and the Kastner-Boursault Prize (2000 fr.), for the best work on the applications of electricity in the arts, industry and commerce. In Statistics, a Montyon Prize (500 fr.). In Chemistry, the Jecker Prize, and a La Caze Prize (each of 10,000 fr.), for researches in chemistry. In Mineralogy and Geology, the Delesse Prize (1400 fr.). In Physical Geography, the Gay Prize (2500 fr.), for a study of the distribution of alpine plants in the mountains of the Old World. In Botany, the Bordin Prize (3000 fr.), for a study of the influence of external conditions upon the protoplasm and nucleus in plants; the Desmazières Prize (1600 fr.), for a study of cryptogams; the Montagne Prizes (1000 fr. and 500 fr.), for researches on the anatomy, physiology, description, or development of the lower cryptogams; the Thoré Prize (200 fr.), for the best work on the cellular cryptogams of Europe; the De la Fons Melicocq Prize (900 fr.), for botanical work done in the north of France. In Anatomy and Zoology, the Grand Prize of the Physical Sciences (3000 fr.), for a biological study of the soft water Nematods; the Savigny Prize (1300 fr.), for the assistance of young travelling zoologists.

In Medicine and Surgery, a Montyon Prize; the Barbier Prize (2000 fr.), for a discovery in surgery, medicine or pharmacy of service in the art of healing; the Breant Prize (100,000 fr.), for a specific cure for Asiatic cholera; the Godard Prize (1000 fr.), for work on the anatomy, physiology and pathology of the genito-urinary organs; the Bellion Prize (1400 fr.); the Mège Prize; the Lallemand Prize (1800 fr.), for the encouragement of work on the nervous system; and the Baron Larrey Prize (1000 fr.), for the best work on military medicine, surgery or hygiene. In Physiology, the Pourat Prize (1400 fr.), for experimental work on the cooling due to muscular contraction; a Montyon Prize (750 fr.), and the Philipeaux Prize (890 fr.), for work in experimental physiology; and a La Caze Prize (10,000 fr.).

Among the general prizes offered are the Arago and Lavoisier Medals, the Montyon Prize for unhealthy trades, the Wilde Prize (4000 fr.), the Cahours Prize (3000 fr.), the Tchihatchef Prize (3000 fr.), for Asiatic exploration, the Petit d'Ormoy Prizes (10,000 fr. each), for work in the mathematical or physical sciences, the Leconte Prize (50,000 fr.), for a new and capital discovery in mathematics, physics, chemistry, natural history or medical science, the Jean Reynaud Prize (10,000 fr.), the Saintour Prize (3000 fr.), the Gegner Prize (3800 fr.), the Trémont Prize (1100 fr.), and the Laplace and Rivot Prizes.

Of these prizes, the Lalande, La Caze, Delesse, Desmazières, Leconte and Tchihatchef are expressly stated as being open without distinction of nationality.

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

CAMBRIDGE.—Mr. C. T. R. Wilson, F.R.S., Fellow of Sidney Sussex College, has been appointed University Lecturer in Experimental Physics, in succession to Prof. Wilberforce, now of Liverpool. The appointment of Mr. H. Herbert Smith as Gilbey Lecturer in Agriculture has been confirmed by the Senate.

The following awards in Natural Science have been made at the combined examination for entrance scholarships held by ten of the colleges in December, 1900:—

Clare College.—£60, Leather, Bridlington School; £50, Pears, Clifton College; £40, Byatt, Charterhouse; Johnson Exhibition, Jordan, Bedford School.

Trinity Hall.—£40, Hopkins, St. Paul's, and Potts, Kingswood School.

Trinity College.—£80, Chittock, Harrow; £75, Bulleid, Exeter School; £50, Bray, Harrow; Sizarship, Mottram, St. Olave's; £50, Darwin, Marlborough; £40, Browning, Westminster, Chase, Oundle School, and Hodgson, Bedford rammar School.

Pembroke College.—£40, Straus, Harrow.

Gonville and Caius College.—£60, Whitehead, Battersea Grammar School; £70 (Salomons Engineering Scholarship), Brinton, Cheltenham College; £30, Coxon, Shrewsbury School.

King's College,—£80, Spens, Rugby.

Jesus College.—£60, Crawford, Nottingham High School.

Christ's College.—£60, Radice, Bedford Grammar School; £40, Bygrave, Giggleswick School; £30, Dobell, Cheltenham College.

St. John's College.—£60, McDonnell, St. Paul's; £40, Jolly, Framlingham School.

Emmanuel College.—£60, Taylor, King Edward's School, Birmingham; £40, Watkins, Shrewsbury School.

THE ninth jubilee of Glasgow University will be celebrated on June 12-14.

FOR many years a large proportion of the national food supply has been dependent on the preservation of meat and fruit in transport and storage by means of artificial cold, so that the subject of refrigeration is one of great and growing importance to the public. Within the last two years a more special interest has been exhibited in this and kindred subjects by the cheaper and more convenient production of liquid air, the proposed applications of it, and the remarkable scientific discoveries to which it has led. Those of the public who wish for authoritative guidance and clear ideas on the whole subject of refrigeration will shortly have an opportunity of obtaining them placed within their reach. The Technical Education Board of the London County Council, acting in conjunction with the Council of University College, London, have arranged for a series of lectures on the artificial production of cold to be delivered in the chemical theatre of the college in Gower Street by Dr. W. Hampson. The lectures will begin on January 18, at 5.30 p.m., and will be illustrated by experiments. Those who wish to attend, or to obtain a syllabus of the lectures, should apply to the secretary of the college. Young engineers, and others who are engaged in practical work in connection with refrigerating machinery or cold storage, and who have not had the advantage of a systematic training in the physical sciences, should find this a useful opportunity of learning to understand better the connection between their work and the scientific principles involved in it.

THE case of Regina *versus* Cockerton is likely to have a profound effect on our national education. As readers of NATURE may remember, a district auditor, dealing with the accounts of the London School Board, disallowed certain sums paid out of the rates for the teaching of science and art in elementary schools according to the rules of the South Kensington "Directory," as distinguished from those contained in the "Code" of the Education Department. These disallowances were brought before Mr. Justice Wills and Mr. Justice Kennedy in the Queen's Bench Division with a view to having them quashed. But the Court has upheld the view taken by the auditor. The London School Board has been non-suited all along the line. To quote Mr. Justice Wills: "It is not within the power of the Board to provide, at the expense of the ratepayers, science and art schools or classes in day schools; . . . science and art classes in evening continuation schools are as much beyond the scope of rate-aided education as in day schools; but that in both such educational work may be carried on by the School Board provided the whole of the funds required for it are furnished from sources other than contributions from the rates." There is little likelihood that the matter will be allowed to rest here; it is bound to go ultimately to the House of Lords. But, whatever may be found to be the present state of the law, one thing the case makes transparently clear, and that is the chaotic condition of English education. As the *Times* said the other day, "by showing up the existing confusion and to some extent aggravating it, the judgment may perhaps hasten some comprehensive scheme for classifying education in a rational way."

SOCIETIES AND ACADEMIES.

LONDON.

Royal Society, December 13, 1900.—"Additional Notes on Boulders and other Rock Specimens from the Newlands Diamond Mines, Griqualand West." By Prof. T. G. Bonney, F.R.S.

Shortly before the outbreak of the war in South Africa, a parcel of specimens from the Newlands Mine, West Griqualand, was sent

to Mr. C. Trubenbach, managing director in London, who forwarded them to the author for examination. They consisted of (1) boulders, (2) the diamantiferous rock (blue ground), (3) country rock. (1) One angular specimen, a felsite or porphyrite, with fluxion structure, might be only a fragment of a dyke or a flow; the other eight were more or less water-worn. All were bolocrystalline igneous rocks, two being saxonites, two varieties of lherzolite, with a few garnets, one an enstatite-eulysite, one an eclogite like those described last year, but without any diamonds, one a hornblendic gabbro, exhibiting an interesting micropegmatitic structure with felspar and pyroxene, and one a diorite. (2) The blue ground presented a general resemblance to that from the De Beers mines—the so-called kimberlite—but its matrix contained a much larger amount of a minute, secondary brown mica. This matrix had been analysed by Mr. C. James at University College, with the result that the CO_2 and H_2O only amounted to 13·55 per cent., the magnesia being 12·14, and the other constituents showing that serpentine could not, at most, form more than about 25 per cent. of the rock. This, then, was yet another proof that the so-called kimberlite could not be an altered peridotite, but was really, as the writer contended, a breccia of rather variable composition. No diamonds were observed this year in the boulders described, but Mr. Trubenbach had obtained another specimen of a pyrope enclosing a small but well-formed diamond. (3) The country-rock. Of this the writer had examined, among others, a variety called "bastard blue" by the miners, which had occurred above the ordinary "blue" and was supposed by them to be related to it. This, however, was not the case. It was a mudstone containing little pebbles of diabase and, more rarely, of a microgranite and a subcrystalline limestone. It was, however, interesting as showing the existence of basic igneous rocks of Triassic or pre-Triassic age. Besides that, and the additional evidence as to the nature of the blue ground, this investigation brought the number of species or strongly-marked varieties of holocrystalline rocks which occur as boulders more or less waterworn up to seven at the very least. The author was of opinion that the most enthusiastic advocate of concretionary action would now be obliged to admit that the specimens, two of which, described in his last paper, had contained diamonds, were rock fragments which had been shaped by the action of water.

Mathematical Society, December 13, 1900.—Dr. Hobson, F.R.S., President, in the chair.—Mr. Basset, F.R.S., spoke on the real points of inflexion of a curve.—Miss Barwell read a paper entitled, "On the conformal representation of polygons on a half plane."—Prof. Elliott, F.R.S., communicated his own paper, "The syzygetic theory of orthogonal Binariants," and gave an account of a paper by Mr. A. L. Dixon entitled "An addition theorem for hyperelliptic functions."—The following papers were communicated by their titles: On some properties of groups of odd order, ii., Prof. Burnside, F.R.S.—On discriminants and envelopes of surfaces, Mr. R. W. Hudson.—Note on the inflexions of curves with double points, Mr. H. W. Richmond.

Zoological Society, December 18, 1900.—Dr. A. Günther, F.R.S., Vice-President, in the chair.—The Secretary exhibited, on behalf of Major A. St. Hill Gibbons, the skull and horns of a white rhinoceros (*Rhinoceros simus?*) from the White Nile, and the mounted heads of two species of Topi antelopes, which had been procured by Major Gibbons during his recent journey through Africa from south to north.—The Secretary also exhibited, on behalf of Sir Harry Johnston, K.C.B., some pieces of skin of an apparently new species of zebra which had been ascertained to inhabit the forest on the banks of the Semleki River near the borders of the Uganda Protectorate.—A communication was read from Capt. Stanley S. Flower, containing an account of the animals he had obtained or observed during Sir William Garstin's expedition to the White Nile. Amongst these were examples of several rare species of antelopes, such as the white-eared kob (*Cobus leucotis*) and Mrs. Gray's kob (*Cobus maria*), and numerous specimens of the shoe-bill or whale-headed stork (*Balaeniceps rex*).—A communication was also read from Mr. W. Malcolm Thomson containing an account of a large branchiate polynoid (*Lepidonotus giganteus* Kirk) from New Zealand.—A communication from Mr. H. M. Kyle (of St. Andrews, N.B.), contained a description of a new genus and species of flat-fishes from New Zealand, under the name *Apsetta thompsoni*.—Dr. A. G. Butler contributed a paper on the butterflies lately collected, and presented to the British Museum, by Lord Delamere. The specimens had been obtained chiefly near Mount Kenya, in British East Africa, and had been referred by the author to seventy-nine species, which were enumerated in the paper.—Prof. D'Arcy W. Thompson, C.B., exhibited and described a large specimen of a cuttle-fish (*Ancistroteuthis robusta* Steenstrup) from Unalaska. The generic position of this cuttle-fish had previously been uncertain, owing to the absence of knowledge of the tentacular club. This was now described for the first time, and confirmed Steenstrup's provisional identification.—Mr. F. E. Beddard, F.R.S., described a new species of earthworm under the name of *Amyntas alexandri*. The specimen had been sent to him from Kew Gardens, whither it had been imported from the neighbourhood of Calcutta.

PARIS.

Academy of Sciences, December 24, 1900.—M. Maurice Levy in the chair.—Formulæ and tables for calculating the times and heights of high and low water, the heights from hour to hour being known, by M. E. Guyou. The heights for three consecutive hours being known, a very simple formula is given for calculating the time of high water.—On the origin of chemical combination and the combination of silver with oxygen, by M. Berthelot. Silver foil, heated with oxygen in sealed tubes at varying temperatures, is slightly attacked, some argentous oxide being formed and the silver becoming different in appearance. This action commences at a temperature of about 200° if the time of heating is very prolonged, and becomes very appreciable at 500°–550° C. If the oxygen is replaced by steam or carbon dioxide the silver is absolutely unchanged.—Silver and carbon monoxide, by M. Berthelot. Silver foil, after four hours heating with dry carbon monoxide at 500°–550°, becomes changed in appearance, and some three to four per cent. of the gas disappears, carbon being deposited and carbon dioxide produced.—Hydrogen and silver, by M. Berthelot. Hydrogen, heated with silver at 550° in a sealed tube, behaves differently from nitrogen, steam or carbon dioxide, as the metal alters considerably in appearance. It is possible that a compound is formed analogous to sodium hydride.—On the theorem of Hugoniot and some analogous theorems, by M. P. Duhem.—The first sign of life, by M. Augustus D. Waller. Following up some researches on the last sign of life, it results that if a *blaze* is the last sign it should also be the first. Some experiments with hens' eggs confirm this view.—On congruences of which the two focal pencils are cyclic, by M. C. Guichard.—The homographic compass, realising by articulations general plane homography, by M. G. Kœnigs.—On Neumann's method of the arithmetical mean, by M. W. Stekloff.—On a series relating to a theory of a linear differential equation of the second order, by M. A. Liapounoff.—On the theta functions of three variables, by M. M. Krause.—The theorem of vortices in thermodynamics, by M. Jougnet.—Permanent modifications of metallic wires and their electrical resistance, by M. H. Chevallier. The same wire is submitted to a series of heatings, which are alternately fixed and oscillating, and the variations of resistance measured. It was found that the permanent variations of resistance are greater when the temperature is oscillating than when it is fixed.—On the electromotive force of magnetisation, by M. René Paillot. It has been shown by M. Hurmuzescu that in a battery formed of two electrodes of iron, one of which is magnetised, the latter becomes positive with respect to the non-magnetised one. These experiments have now been extended to much stronger fields, 30,000 units, and it is found that for a given specimen of iron and acid the electromotive force of magnetisation tends always to a fixed limit.—The luminescence of a rarefied gas round metallic wires communicating with one of the poles of an induction coil, by M. J. Borgmann.—An apparatus allowing several physiological applications of the light produced by an incandescent lamp, by MM. Foveau de Courmelles and G. Trouvé. An application of parabolic mirrors.—On the liquefaction of gaseous mixtures. The isotherms of a mixture, by M. F. Caubet. A discussion of results obtained with mixtures of carbon dioxide and sulphurous acid, and of carbon dioxide with methyl chloride.—A contribution to the study of rarefied gases, by M. Albert Colson.—Influence of pressure on the phenomena of chemical equilibrium, by M. O. Boudouard. A description of some experiments upon the formation of carbon monoxide from carbon dioxide and charcoal.—On the selenides of copper, by M. Fonzes-Diacon. Some new methods of pre-

paring copper selenide, CuSe.—On some chlorobromides of thallium, by M. V. Thomas.—The action of reducing agents upon the two isomeric nitrodimethylacrylic esters, by MM. L. Bouveault and A. Wahl. Of the various substances tried, the only one giving a good yield of the corresponding amido-body was aluminium amalgam, several derivatives of which are described.—On tannase, by M. A. Fernbach. The tannase was prepared by the action of *Aspergillus Niger*, and then rendered sterile by filtration through porcelain.—Tannase, a diastase capable of hydrolysing gallotannic acid, by M. Henri Pottevin.—On the glycolysis of different sugars, by M. P. Portière. Of the sugars examined, the only ones which underwent glycolysis in the presence of the blood of the dog or the rabbit were galactose, lævulose and maltose.—Study of uranium nitrate, by M. Œchsner de Coninck. Densities of aqueous and alcoholic solutions of uranium nitrate, together with some solubilities in some other liquids.—Reaction of *p*-diazobenzene sulphonate of sodium upon the cystinate of iron existing in contaminated waters, by M. H. Causse. A reply to the criticisms of M. Molinié.—On the chemical transformations which take place during the evolution of the bud, by M. G. André. From the point of view of the distribution of the mineral material and organic substances, the evolution of the bud is comparable with the germination of the seed.—On some derivatives of methylnonyl-ketone, by M. H. Carette.—On the relations between the chemical constitution of the sexual products and that of solutions capable of determining parthenogenesis, by MM. Yves Delage and Marcel Delage. The theory advanced by Loeb as to the influence of magnesium salts in development requires a difference in the proportion of magnesium salts in the male and female. An experimental study shows that this is not the case, and hence that the proposed theory is inexact.—Germinative cells: male ovules and the cells of Sertoli, by M. Gustave Loisel.—On the signification of the basilar granulations of cilia, by M. P. Vignon.—The physiological relations of intermittent albuminuria, by M. A. Charrin.—Phagocytosis of the Eberth bacillus, by MM. O. F. Mayet and J. Bertrand. The authors have been able to clearly demonstrate the absorption of the Eberth bacillus by the white blood corpuscles.—Cytometric and caryometric researches on the motor nervous cells after the section of their cylindraxis, by M. G. Marinesco.—Remarks on the experiments of Mlle. Barthelet on telegony, by M. Edouard Rogez.—Remarks on the same subject, by M. Giard.—On the parasitism of *Fusarium roseum* and allied species, by M. Louis Mangin.—On the cytology of the Gastromycetes, by M. René Maire.—Variations of structure in a green algæ, *Stichococcus bacillaris*, under the influence of the medium, by MM. L. Matruchot and M. Molliard.—On the development of etiolated plants afterwards turned green by light, by M. H. Ricome.—Effects of annular decortication in some herbaceous plants, by M. Lucien Daniel.—On the age of the granitic *massif* of Cauterets and Néouvielle (High Pyrenees) and of part of the ancient neighbouring formations, by M. A. Bresson.—On the upper Cretacean at Mozambique, by M. Paul Choffat.—The ice caps of the Antarctic regions, by M. Henri Arctowski.—Barometer variations and the synodic revolution, by M. A. Poincaré.—Atmospheric electricity according to observations at the Eiffel Tower and at the central meteorological office, by M. A. B. Chauveau.—On the determination of the density of sea-water, by M. J. Thoulet.

DIARY OF SOCIETIES.

THURSDAY, JANUARY 3.

RÖNTGEN SOCIETY, at 8.—Continental Progress in Practical Radiography and Apparatus: A. W. Isenthal.

FRIDAY, JANUARY 4.

GEOLOGISTS' ASSOCIATION, at 8.—The Geology of Swanage—Chapman's Pool to Punfield Cove (Kimeridge Clay to Upper Greensand): Horace W. Monckton.

MONDAY, JANUARY 7.

SOCIETY OF CHEMICAL INDUSTRY, at 8.—The Early Manufacture of Sulphuric and Nitric Acids: Oscar Guttmann.—Note on the So-called "Heat Test" for Explosives: W. Cullen.

VICTORIA INSTITUTE, at 4.30.—Hornets: Rev. F. A. Walker.

TUESDAY, JANUARY 8.

INSTITUTION OF CIVIL ENGINEERS, at 8.—Glasgow Bridge: B. H. Blyth. Railway Bridge over the Fitzroy River, at Rockhampton, Queensland: W. J. Doak.—The Niagara Falls and Clifton Steel Arch Bridge: L. L Buck.—Monthly Ballot for new members.

WEDNESDAY, JANUARY 9.

GEOLOGICAL SOCIETY, at 8.—The Geology of South-Central Ceylon: John Parkinson.—Note on the Occurrence of Corundum as a Contact-Mineral at Pont Paul, near Morlaix (Finistère): A. K. Coomára-Swámy.

THURSDAY, JANUARY 10.

MATHEMATICAL SOCIETY, at 5.30.—On the Singularities of Quartic Curves: A. B. Basset, F.R.S.—On Streaming Motions past Cylindrical Boundaries: Prof. Love, F.R.S.

INSTITUTION OF ELECTRICAL ENGINEERS, at 8.—Capacity in Alternate Current Working: W. M Mordey.—*And, if time permit*: The Use of Aluminium as an Electrical Conductor, with New Observations upon the Durability of Aluminium and other Metals under Atmospheric Exposure: John B. C. Kershaw.

FRIDAY, JANUARY 11.

ROYAL ASTRONOMICAL SOCIETY, at 8.

INSTITUTION OF CIVIL ENGINEERS, at 8.—Geodesy: Wilfrid Airy.

CONTENTS.